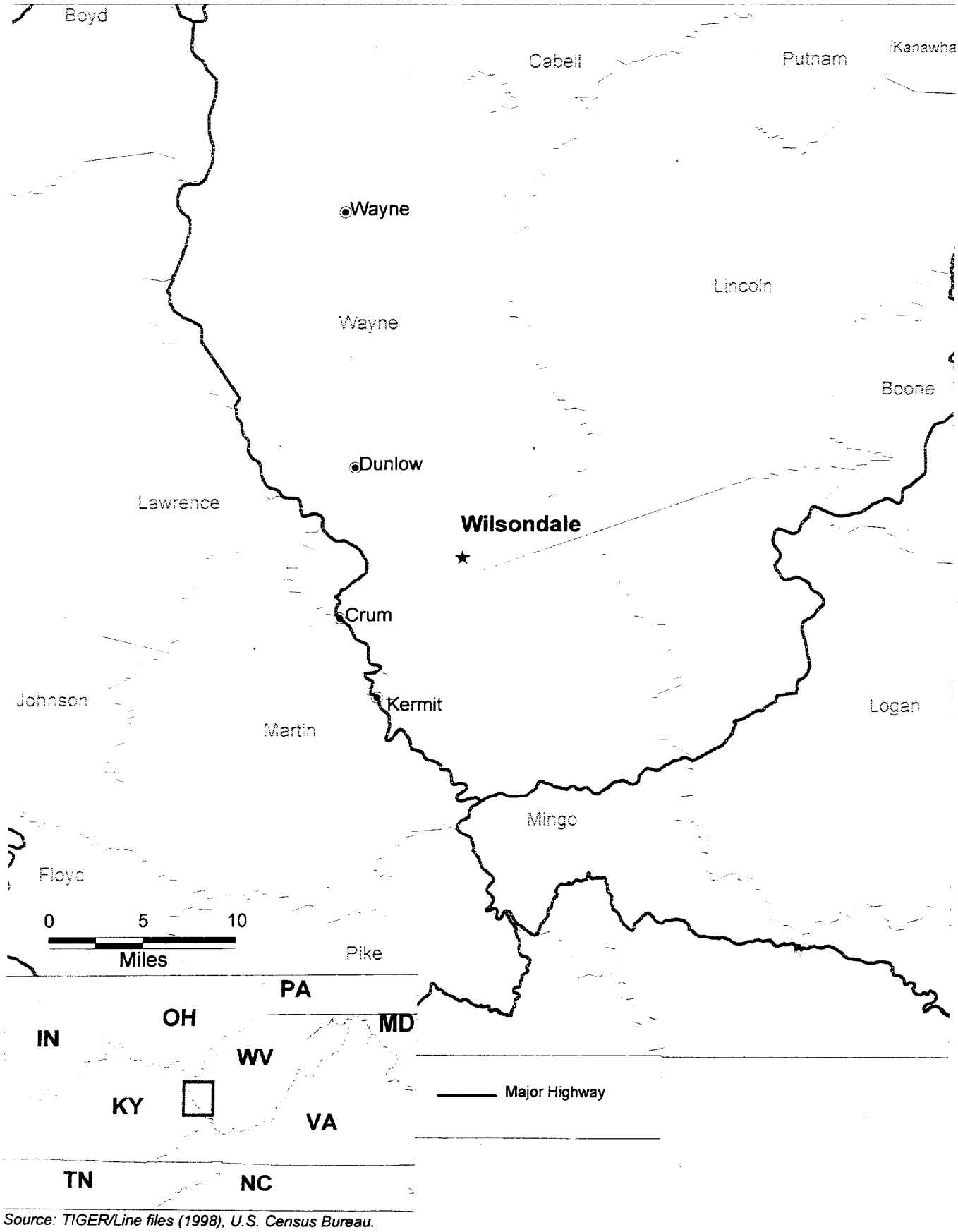
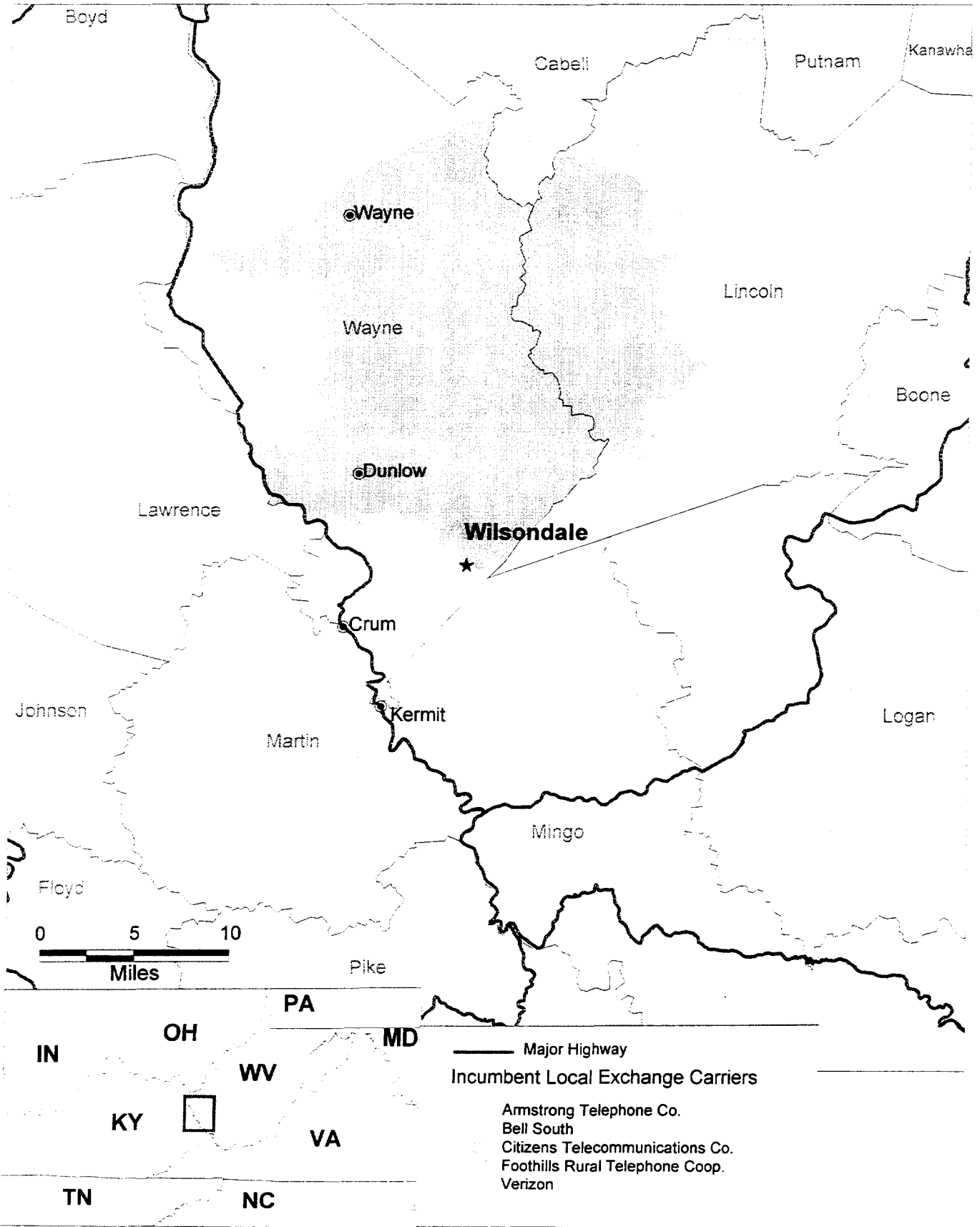
Figure Y
Wilsondale, West Virginia and Vicinity



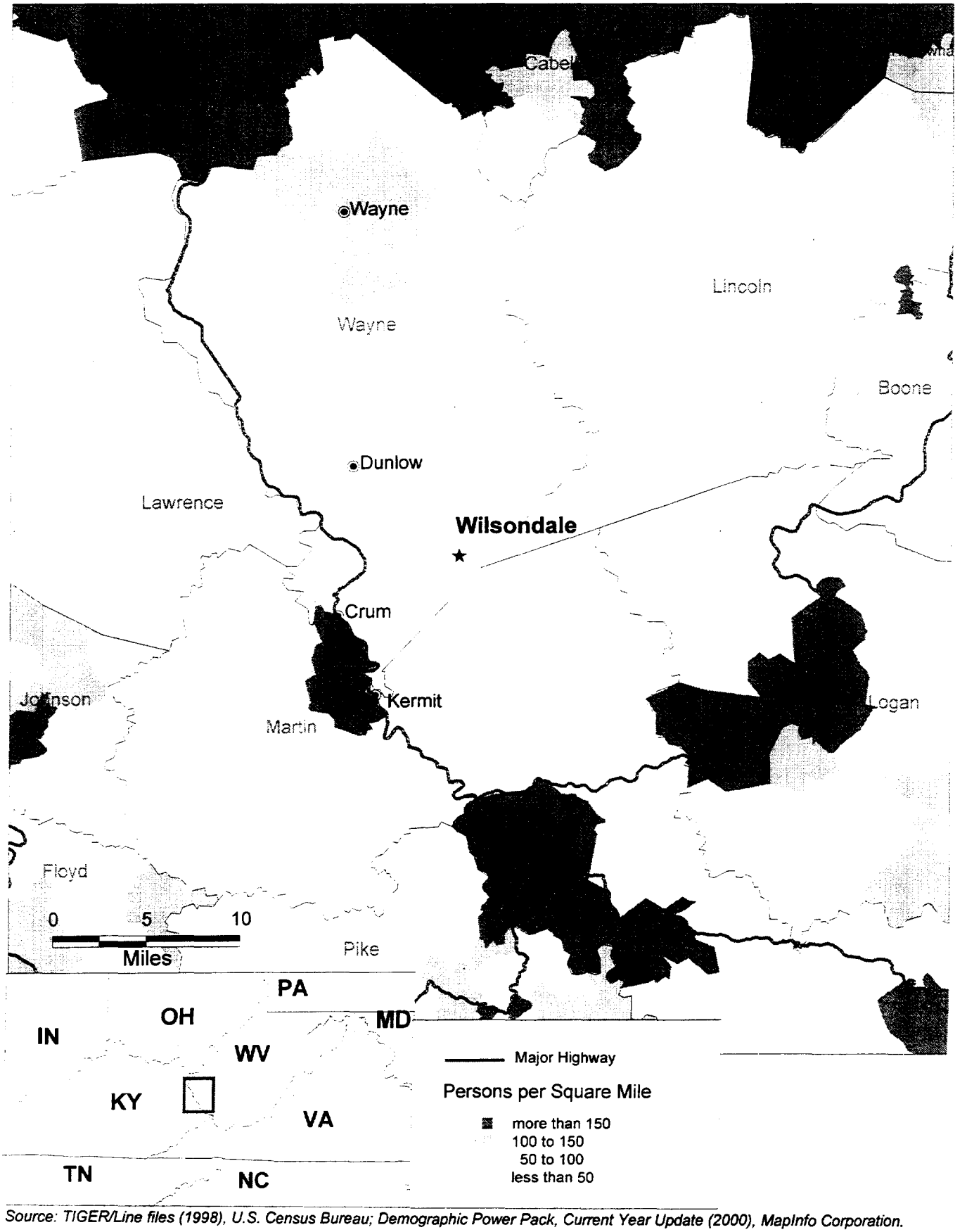
Source: TIGER/Line files (1998), U.S. Census Bureau.

Figure Z
Wilsondale, West Virginia and Vicinity
Incumbent Local Exchange Carriers



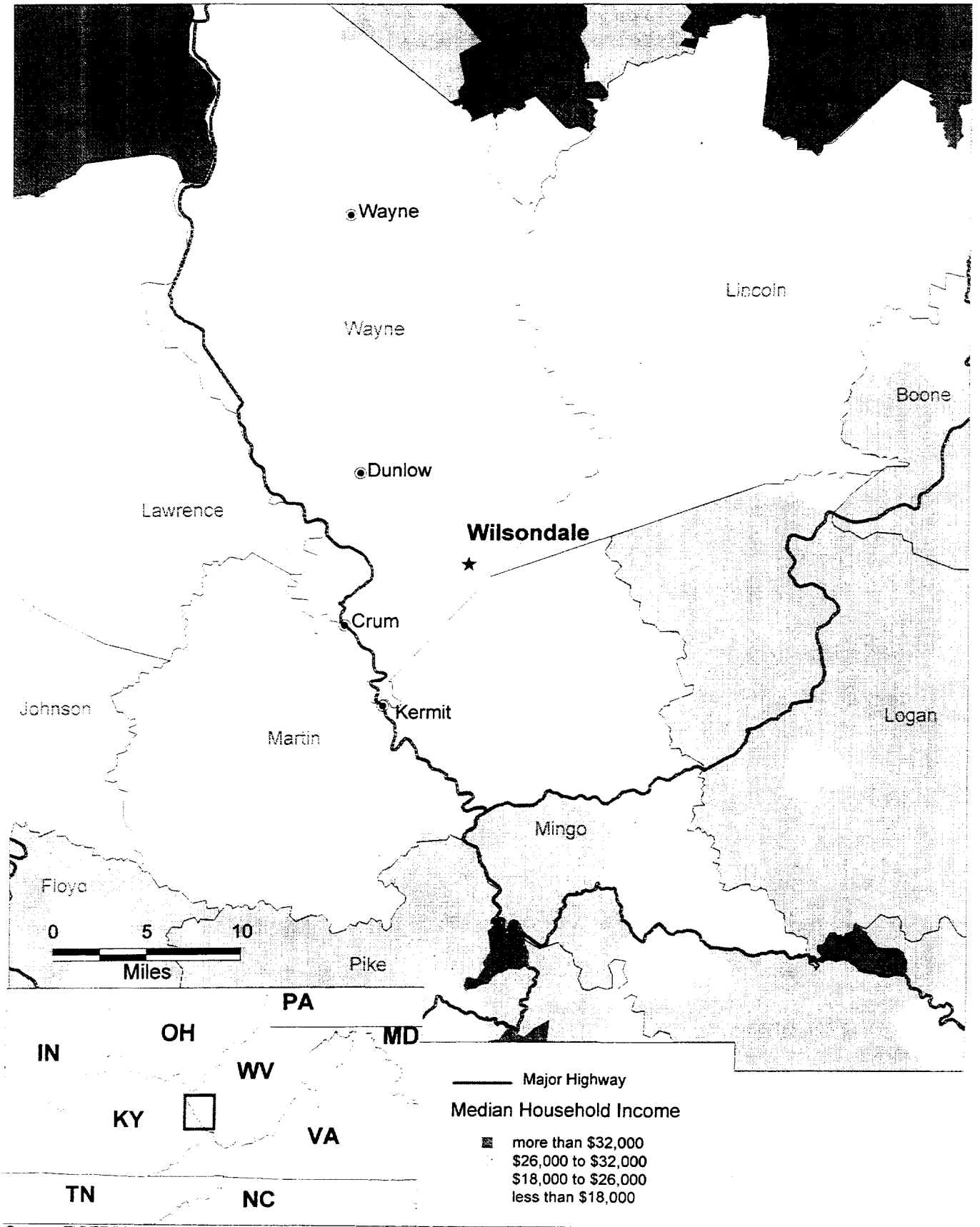
Source: TIGER/Line files (1998), U.S. Census Bureau; Wire Center Premium (April 2000), Geographic Data Technology, Inc.

Figure AA
Wilsondale, West Virginia and Vicinity
Population Density



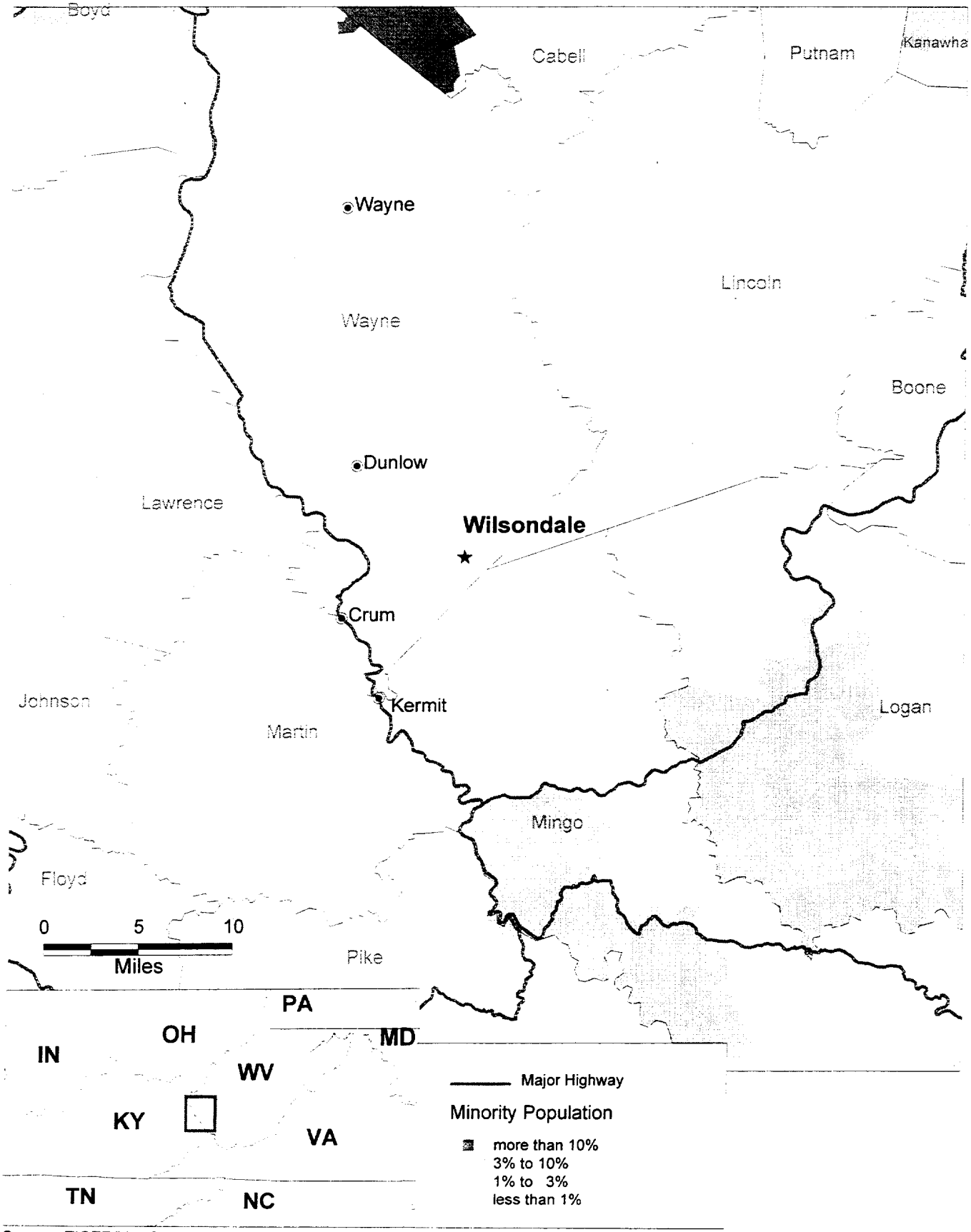
Source: TIGER/Line files (1998), U.S. Census Bureau; Demographic Power Pack, Current Year Update (2000), MapInfo Corporation.

Figure AB
Wilsondale, West Virginia and Vicinity
Median Household Income



Source: TIGER/Line files (1998), U.S. Census Bureau; Demographic Power Pack, Current Year Update (2000), MapInfo Corporation.

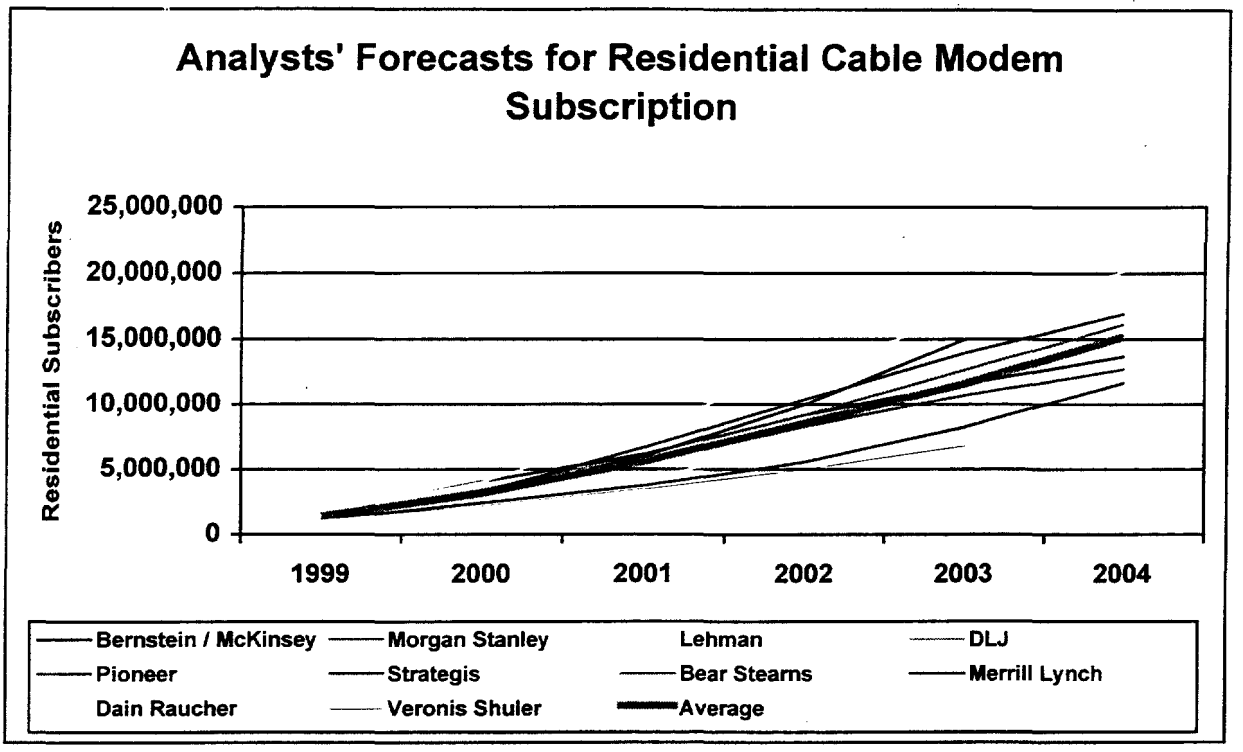
Figure AC
Wilsondale, West Virginia and Vicinity
Minority Population



Source: TIGER/Line files (1998), U.S. Census Bureau; Demographic Power Pack, Current Year Update (2000), MapInfo Corporation.

Appendix D

1. The following figure depicts the individual analyst forecasts on which Figure 26 in the Report is based.

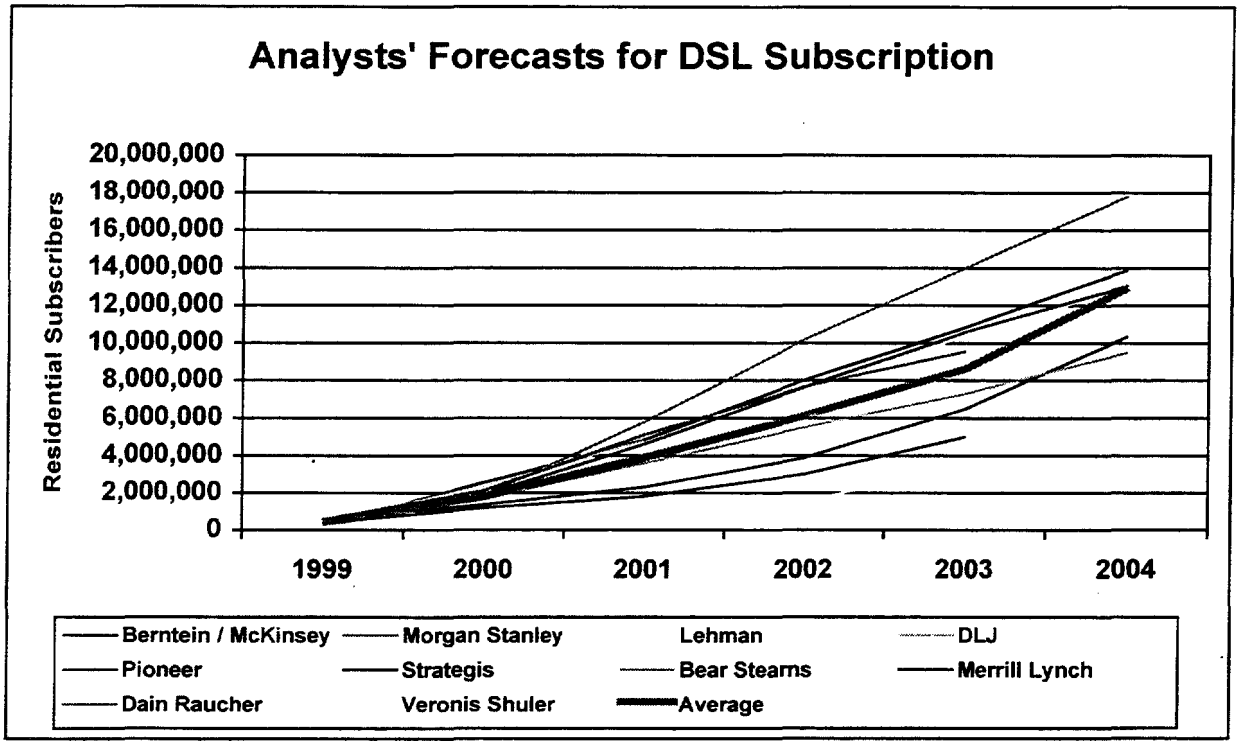


The above chart, as well the others in this Appendix D rely on the following analyst reports:

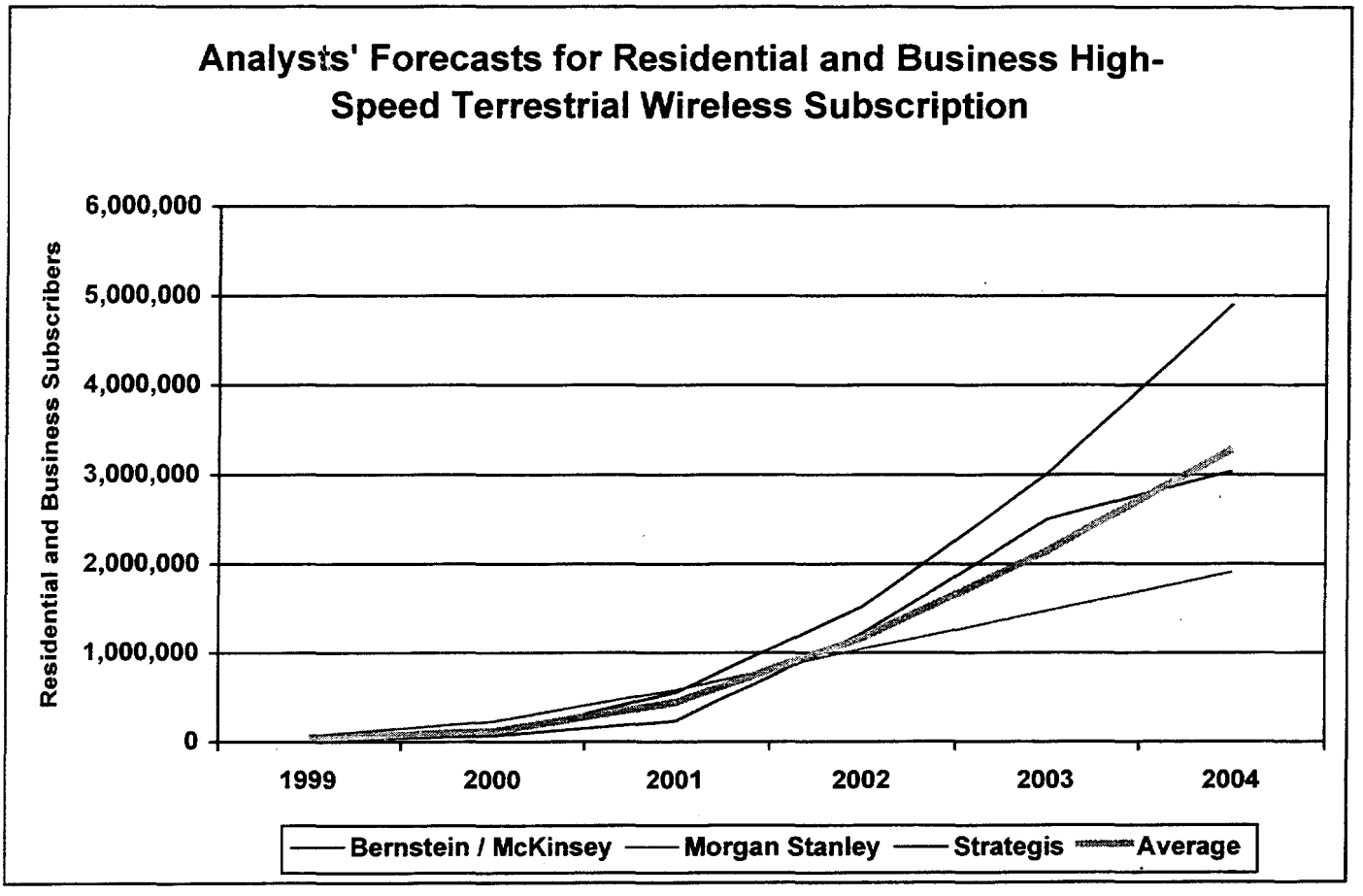
1. Stanford C. Bernstein & Co. and McKinsey & Co., Inc., *Broadband!* (2000).
2. Richard Klugman, DLJ *Telecommunications Services: First Quarter 2000 Preview* (Apr. 17, 2000).
3. Raymond Lee Katz and Adria B. Markus, Bear Stearns *Cable Advanced Telecommunications Capabilities and Broadband, Byte Fight! Competition and Response in Residential Video and Broadband.*
4. Vernois Suhler & Associates, Communications Industry Forecast.
5. Jeff Camp, Richard Bilotti, Simon Flannery, and Mary Meeker, Morgan Stanley Dean Witter, *The Broadband Report - Reaping What You Sow: ROI in the Broadband Market* (2000).
6. Pioneer Consulting, *Data CLEC's: xDSL Markets and Opportunities for Small and Medium-sized Businesses* (1999).
7. Jessica Reif Cohen and Nathalie Brochu, *Q4: Expect High-Speed Data to Drive Results in 2000*, Merrill Lynch, Feb. 16, 2000.

8. Blake Bath, Lehman Brothers, *Broadband Report Card-Conference Call Notes* (Apr. 2000).
9. Strategis Group, *High Speed Internet, Cable Modems, DSL and Wireless Broadband*, Dec. 1999.
10. Dain Rauscher Wessels, *Bullish on Broadband* (2000)

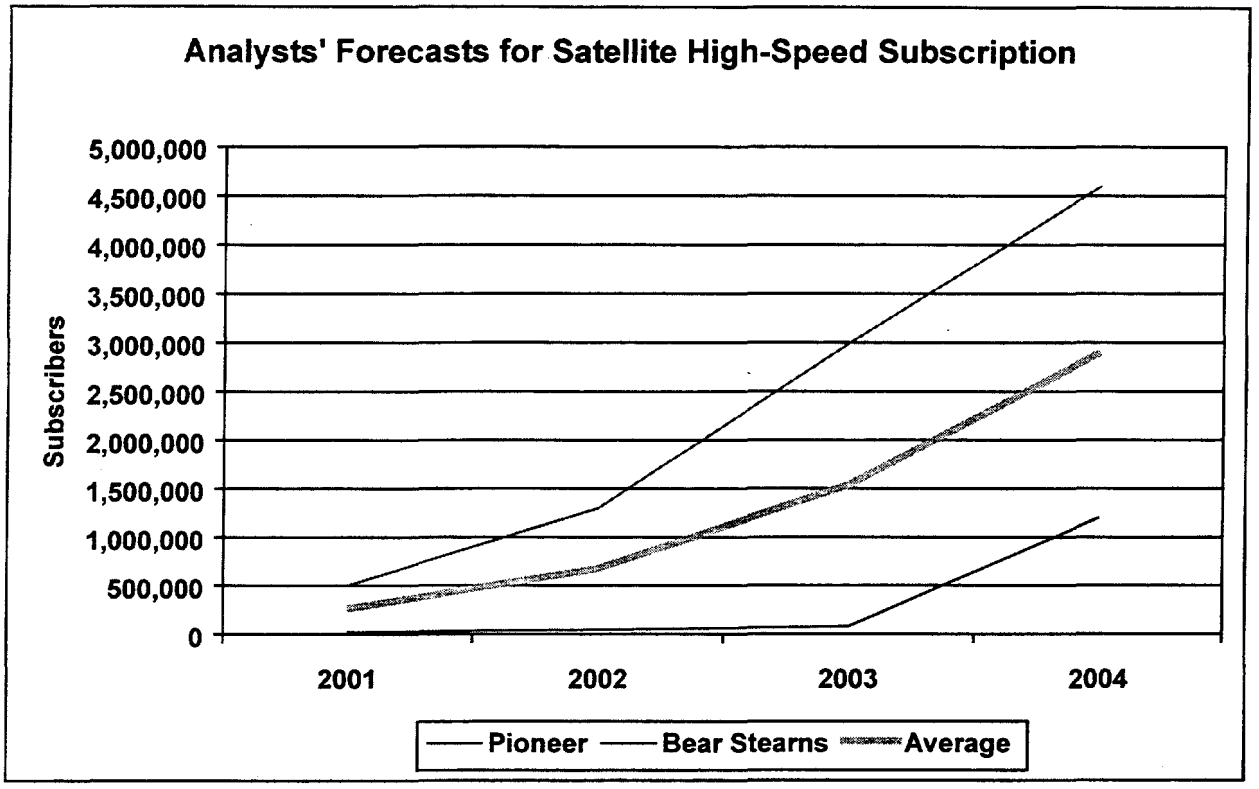
The following figure depicts the individual analyst forecasts on which Figure 27 in the Report is based.



The following figure depicts the individual analyst forecasts on which Figure 28 in the Report is based.



The following figure depicts the individual analysts forecasts on which Figure 29 in the Report is based.



The following figure summarizes publicly available information on the upgrade status and capital expenditures for the leading cable operators. Except where noted, upgraded cable plant represents upgrades to 750 MHz.

Cable Operator ("MSO")	Homes Passed by Cable Plant (millions)	Subscribers to Video Services (millions)	Percent of Upgraded Cable Plant	Amount Invested for High-speed Data in 1999 (millions)[1]
AT&T	28	16	51 %[2]	$515.3
Time Warner	20.6	12.6[3]	80 % – 85 %[4]	$503.8
Comcast	9.5	5.7	85 %[5]	$269.8
Charter	N/A	6.3[6]	32 %[7]	$147.0
Cox	8	5[8]	55 %[9]	$460.0
Adelphia	7.7	5[10]	82 %[11]	$184.9
Cablevision	5	3.5[12]	60 %[13]	$174.7

[1] Richard Bilotti, Benjamin Swinburne, Gary Leiberman, and Marc Nabi, *1Q00 Review/2Q00 Preview: Party On at the Oligopoly Lounge*, Morgan Stanley Dean Witter, Apr. 4, 2000 at 33 (Morgan Stanley, *Oligopoly Lounge*).

[2] AT&T Comments at 9; Merrill Lynch, *Cable Television* at 23 (Apr. 26, 2000) (Merrill Lynch, *Cable Television*). Although AT&T's upgrade efforts lag significantly behind that of other top cable operators (*see* Paul Kagan Associates, Inc., *Cable TV Investor*, Mar. 24, 2000, at 10), management plans to end the year with 85 percent of its network upgraded to at least 550 MHz with two-way capability. At year-end 1999, MediaOne, which recently merged with AT&T, had upgraded 76 percent of its pre-merger cable plant to 750MHz with two-way capability.

[3] Time Warner, Inc., *1999 Annual Report* 34.

[4] Merrill Lynch, *Cable Television* at 23; *see also* Time Warner, Inc., *1999 Annual Report* at 34. Time Warner expects to complete its upgrade program by the end of year 2000. *Id.*

[5] Comcast Comments at 5. Comcast claims that its 550 MHz hybrid-fiber coaxial cable can be made two-way with minor additional upgrades. *Id.* at 6.

[6] Charter Communications, *2000 Proxy Materials & 1999 Financial Report* A-1.

[7] At the end of 1999, in addition to the 32 percent of its plant at 750 MHz, Charter had upgraded an additional fifteen percent of its plant to at least 550 MHz, and about 35 percent had two-way interactive capability. Merrill Lynch, *Cable Television* at 23. Charter is accelerating its upgrade program in 2000. *Id.*

[8] Paul Kagan Associates, Inc., *Cable TV Investor*, Mar. 24, 2000 at 10.

[9] Cox Communications Comments at 5-6. Cox estimates that 70 to 74 percent of its systems will be upgraded by the end of year 2000. *Id.*

[10] Paul Kagan Associates, Inc., *Cable TV Investor*, Mar. 24, 2000, at 10.

[11] *Id.* Adelphia has upgraded 59 percent of its plant to 750MHz and an additional 23 percent to 550 MHz. *Id.*

[12] *Id.*

[13] Merrill Lynch, *Cable Television* at 23.

APPENDIX E

COMMENTS:

Alcatel USA, Inc.
Association for Local Telecommunications Service (ALTS)
Alliance for Public Technology
America's Fiber Network (late filed letter to Chairman Kennard)
American Library Association
AT&T Corp.
Elizabeth W. Beaty
Bell Atlantic
BellSouth Corp.
Jennie Bourne (late, not posted as of 10;30 a.m. 3/21)
Dave Burstein (late, not posted as of 10;30 a.m. 3/21)
Kenneth M. Chipps
Citizens Utilities Co.
Commercial Internet eXchange Association
Commonwealth of the Northern Mariana Islands
Consumer Electronics Association
Cox Communications, Inc.
Alan Dunsmore
EdLiNC
Florida PSC
Judy Harkin
Fritz Hoehne
Hughes Network Systems and Hughes Communications Galaxy, Inc.
General Service Administration
GTE Services, Corp.
iAdvance
Jato Communications Corp.
MCI Worldcom, Inc.
MediaOne Group, Inc.
Metricom, Inc.
National Cable Television Association
National Exchange Carrier Association
National Rural Telecom Association
National Telephone Cooperative Association
Network Access Solutions Corp.
NewPath Holdings, Inc.
Nortel Network Corp.
Northpoint Communications, Inc.
OPASTCO
Pegasus Communications Corp.
Prism Communications Services, Inc.
Public Utility Law Project
Rural Telecommunications Group

Nicholas Sargologos
SBC
Sky Bridge, L.L.C.
Sprint Corp.
Telecommunications Resellers Association
United States Telecom Association
United Telecom Council
US West Communications, Inc.
Erik Juhani Vitto
WGBH Media Access
Wireless Communications Association International, Inc.
Public Service Commission of Wisconsin

REPLY COMMENTS:
Alliance for Public Technology
American Cable Ass'n
American Foundation for the Blind
American Library Ass'n & the Civil Rights Forum
At Home Corp.
AT&T Corp.
Bell Atlantic
BellSouth Corp.
Comcast Corp.
Commercial Internet eXchange Association
Competition Policy Inst.
Alan Dinsmore
Education & Libraries Network Coalition
Excite@Home
Florida Public Service Comm'n
GSA
GTE Services, Corp.
GVNW Consulting
MCI WorldCom, Inc.
Metricom, Inc.
Nat'l Ass'n of Telecom. Officers & Advisors, Nat'l League of Cities, & US Conf. of Mayors
Nat'l Cable Television Ass'n
OPASTCO
Pegasus
Personal Communications Industry Ass'n
Real Access Alliance
SBC Communications, Inc.
United States Telecom Ass'n
United Telecom Council

Separate Statement of
Commissioner Susan Ness

Re: ***Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (CC Docket No. 98-146)***

Congress recognized the critical importance of access to advanced services in Section 706 of the Telecommunications Act of 1996. That Section directs us to determine whether advanced telecommunications capability is being deployed to *all* Americans on a reasonable and timely basis and, if not, to take immediate action to accelerate such deployment.

The data compiled for this second Section 706 Report identify some promising trends. For most of the country, as consumer appetite for bandwidth grows, the number of residential subscribers to advanced services is increasing dramatically. I am encouraged that companies deploying a variety of technologies– including wireline, cable, wireless, broadcast, and satellite – are investing billions of dollars to meet this consumer demand.

But our data also flag some very troubling trends: some communities – especially those in rural and in economically disadvantaged areas -- are at risk of not receiving the same access as other areas.

Meaningful access to broadband facilities may well be the lifeblood of these communities, spelling the difference between economic revitalization and stagnation. Advanced services enable businesses to serve the globe from even the most remote locations. As businesses thrive in these communities, young people can remain in their home towns rather than be forced to migrate to the cities for their economic well-being. And, as we have seen firsthand, broadband access can greatly improve educational and healthcare opportunities for these "at-risk" citizens in both rural and low income areas.

In these early stages of deployment, we have a unique opportunity to prevent a crack from becoming a chasm.

Already, we are taking steps to accelerate the deployment of advanced services. Through E-Rate discounts to schools and libraries, we are helping to bring high-speed services to the very heart of communities across the nation. Not only can a high-speed Internet connection to a school or library be a tremendous resource for the whole community, but the facilities can serve as the foundation for broader deployment throughout the area. We should examine carefully how we can leverage this extremely successful resource.

We are also facilitating the development of new broadband technologies by encouraging innovative solutions to spectrum scarcity. And in collaboration with our state colleagues, we convened a Joint Conference, and crisscrossed the country to identify

and disseminate "best practices" that have been instrumental in delivering advanced services to these particularly vulnerable communities. I applaud the members of the Joint Conference for their outstanding work.

But we need to remain vigilant. We must redouble our efforts to eliminate barriers to competition so companies have the incentive to invest. While the data collected for this report are an improvement over our first effort, our data gathering efforts still need refinement to ensure that we get a complete and accurate picture of whether broadband is being deployed throughout the country. If certain geographic areas or demographic groups are not receiving access to advanced services, we need to understand what may be causing the lag.

We should not assume that one-size-fits-all policies work for all areas of the country or all sizes and types of carriers. Different high-speed access technologies work better in different locations and circumstances. For example, wireless and satellite services on the horizon may be particularly well-suited to reach consumers in remote areas.

Section 706 makes clear that our goal is to encourage the reasonable and timely deployment of advanced services to *all* Americans. Today's Report describes a highly dynamic market for advanced services, and in many areas of our nation, the competitive marketplace is primed for their timely deployment. But I remain deeply concerned about communities at risk – pockets of rural, remote, and economically disadvantaged populations -- where access is lagging. I would like to see the type of innovation and investment that has blessed our largest cities extended to the rest of America.

Concurring Statement of
Commissioner Harold Furchtgott-Roth

Re: ***Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (CC Docket No. 98-146)***

The report that we issue today, consistent with section 706's directive that the Commission regularly determine whether "advanced telecommunications capability is being deployed to all Americans on a reasonable and timely basis," 47 U.S.C. § 706(b), contains much encouraging information regarding the technologies that are being deployed to deliver advanced services in the United States, as well as where those services are currently being provided. Among other things, the data show that various forms of advanced services, including cable, digital subscriber line, wireless, and satellite technologies, are being deployed across the country and that companies are investing heavily in the facilities used to deliver these services. More than 90 percent of the country's population live in zip codes where advanced services have been deployed. Broadband services are available in all fifty states, the District of Columbia, and Puerto Rico. Residential and small business customers have been signing up for advanced services at a fast clip: the number of subscribers to such services has more than doubled in the past year. By all measures, the market for advanced services is thriving, and I therefore agree with our conclusion that the deployment of advanced telecommunications capability to all Americans is "reasonable and timely" within the meaning of section 706. I also believe that many of the deregulatory steps that the Commission is taking in separate dockets will have the beneficial effect of furthering competition in the market for advanced services throughout the United States.

I write separately to comment on our conclusions regarding the availability of advanced services to different areas and population groups throughout our country. The data show that the pace of deployment of advanced services varies throughout the United States. For example, urban residents may be able to obtain access to a number of different types of advanced services, whereas residents of sparsely populated parts of our country may have access to only one type of advanced service, or none at all. In time, we may determine that the current system of telecommunications regulation alone will not guarantee that certain segments of our population will receive "reasonable and timely" access to advanced services. Should we draw such a conclusion, section 706 directs us to "take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market."

But the data before us do not permit us to reach that conclusion now. We must not lose sight of the fact that the market today is in a very early stage of development. As a threshold matter, the data do not demonstrate that, in the near term, large percentages of residential and small business customers will actually demand advanced services. The data plainly show that the vast majority of small business and residential customers today

– *regardless of their income level or where they live* – choose not to subscribe to advanced services. The nationwide penetration rate for small business and residential customers currently stands at 1.7 percent. We could speculate about why this is the case. Perhaps, for instance, residential customers, facing the price of advanced services, have decided that the access they have to advanced services at their workplace or in their community's library is enough for them. Perhaps they are not sure that they want advanced services at all and are waiting to decide if subscribing is worthwhile. In any event, the bottom line is that today virtually *all* residences and small businesses have chosen *not* to subscribe to advanced services, even though, as this order concludes, such technology "is available now and continues to be deployed to a significant number of residential customers in communities of all types – affluent and low income, inner city, suburb, small town and thinly populated countryside," and even though advanced services are typically available at a price that compares to the cost of premium cable service. Consequently, in my view, it is difficult to draw a meaningful conclusion regarding the difference among the subscribership rates for different categories of residential customers, since these rates are uniformly quite low.

I conclude, therefore, the data we have gathered are most fairly understood as demonstrating that small business and residential customers are in the early stages of exploring a flourishing new market and that the market and current regulatory structures are working well to provide consumers with the services they want. I agree that we must continue closely to monitor the deployment of advanced services to ensure that such services are being made available to all Americans in a reasonable and timely fashion. But before we might legitimately begin changing or removing regulations that single out certain population groups for different treatment with respect to the provision of advanced services, we must have a far better understanding of this market.

Separate Statement of
Commissioner Gloria Tristani

Re: ***Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996 (CC Docket No. 98-146)***

I guardedly concur with today's Report. While the Report concludes that certain populations are "particularly vulnerable to not receiving advanced services in a timely fashion," it does not sufficiently state the at risk status of these populations. Moreover, in order to comply with our statutory mandate to "determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion," we must have a better picture of the deployment of advanced services than the existing data afford.

I am troubled about the factors and data that suggest certain populations – those living in rural areas, the U.S. territories, inner cites, and tribal areas, as well as low income consumers and minorities -- are at heightened risk of not having access to advanced services if left to market forces alone. As the Report indicates, the data show a correlation between population density and the presence of broadband subscribers, with areas of low population density much less likely to have subscribers to broadband services. Thus, rural consumers and those on Indian lands outside of population centers are particularly at risk. Other factors, such as the limitations of particular technologies, further increase this risk. Moreover, the correlation between income and advanced services indicates that low-income consumers are likewise at risk of not having access to broadband services, a risk heightened by other factors including the poor quality existing plant in inner cities.

A review of data showing penetration rates for residential high-speed services shows great variance in penetration rates among states. I note that among certain states and U.S. territories, including Wyoming, Puerto Rico, and New Mexico, residential penetration is as low as 0.23%. These data underscore the need to learn more about the relationship between penetration rates and particular population groups, so that we may more closely monitor deployment of advanced services.

While the Commission undertook new data collection efforts in preparation for this second report on the deployment of advanced telecommunications capability, the available data do not provide a full and accurate picture of the state of deployment. The data on which the Report relies suffer from several weaknesses that undermine our ability to draw well-supported conclusions and to identify with specificity at-risk communities. The Commission must rectify this when we undertake data collection efforts in the future.

As the Report itself acknowledges, the zip code data are of limited usefulness, because providers were asked to report whether there is at least one subscriber in a particular zip code, not the *number* of subscribers in a particular zip code. Thus, the data

do not indicate the extent to which the presence of broadband in a particular zip code indicates more widespread availability. The availability of data on actual numbers of subscribers in a particular zip code or data at a more granular geographic area would provide a better picture of the state of deployment. Similarly, because providers were not required to distinguish between residential and small business customers, the data do not provide an accurate snapshot of deployment to residential users. In some zip codes, broadband and advanced services may be available to business users but unavailable, and perhaps unaffordable, to residential users. In addition, the available data do not track service providers with fewer than 250 lines installed to subscribers in any state. Accordingly, there may be a substantial number of small providers' lines that are unreported, another piece of data that is necessary for a more complete view of deployment.

Another major weakness of the data is the lack of information concerning deployment in the United States territories: Puerto Rico, Guam, the U.S. Virgin Islands, the Northern Mariana Islands, and American Samoa. The limited data suggest that there is virtually no advanced services deployment outside the fifty states, but the Commission must engage in further outreach to ensure full reporting and to understand how reasonable and timely deployment in these areas can be assured.

It bears emphasizing that while the case studies included in the Report provide instructive examples of successful broadband deployment strategies, there is no evidence that these case studies are representative of communities of their size in terms of advanced services deployment. While I am pleased to read about deployment success stories, the availability of broadband in four of the five communities studied does not provide reassurance that deployment of advanced services is reasonable and timely.

I commend the Commission's efforts in this year's Report, which I think represents a substantial improvement both in breadth of data and analysis over last year's effort. I particularly commend our staff's work at interpreting the data. Once again, I am hopeful that the Commission will continue to learn from its experience and ensure that it has a more accurate picture of advanced services deployment in our next report.

In sum, while our report again concludes that the deployment of advanced services is reasonable and timely, it indicates there are populations at risk of being left behind the high-speed bandwagon. As Congress determined in Section 706 and throughout the Act, this Commission's responsibility to encourage deployment of advanced services is to all Americans, whether they live in the suburbs, the farms, the reservations, the inner cities, or outside the continental United States. Congress, wisely foresaw and recognized that advanced services must be universally available so that all Americans and all communities throughout America can benefit and be part of the information economy. In accordance with Congress's direction, we must take the necessary steps to ensure that the populations that we have identified as vulnerable and at risk, no longer remain so.